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Original Article

The impact of neighbourhood and municipality characteristics on social cohesion in the Netherlands

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Abstract Up till now, a systematic test of the impact of theoretically relevant locality characteristics on social cohesion has been lacking in Europe. In this paper, we investigated the impact of a wide array of characteristics of Dutch neighbourhoods and municipalities on contact frequency with one's neighbours, tolerance to neighbours from a different race, generalized social trust and volunteering. Based on the homophily proposition, we expected that ethnic and economic heterogeneity in Dutch localities negatively affect these indicators of social cohesion. We also expected that poor localities, localities with high crime rates and localities that suffer from high residential mobility rates offer their residents less favourable circumstances for social cohesion to arise. For our individual level data, we used the survey 'Culturele Veranderingen 2004', which contains 2949 individuals living in 503 neighbourhoods and 245 municipalities. Economic deprivation (at the neighbourhood level) is most consistently negatively related to social cohesion. We did not find a consistent negative impact of ethnic heterogeneity on social cohesion. We conclude that not all aspects of social cohesion are affected in the same way by neighbourhood and municipality characteristics and that the impact of these characteristics on social cohesion depends on residents' income and educational level.

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Keywords: social cohesion; trust; volunteering; neighbourhoods; municipalities; heterogeneity

Introduction

Social cohesion is the social harmony that enhances the quality of public and civic life by feelings of commitment and trust and participation in networks



and civic organizations. It develops from an interplay between personal characteristics and the community one lives in (Wilson, 1987). Social cohesion is a characteristic of a group, yet finds its origins in pro-social attitudes and behaviour of individuals. The ties that individuals have with other individuals, illustrated by associative life and feelings of trust and tolerance to others, are indicators at the individual level of the cohesiveness of a group or community. Although ethnic and economic heterogeneity, poverty, crime and residential mobility of the local environment are all claimed to be related to lower levels of social cohesion (Alesina and La Ferrara, 2000, 2002; Putnam, 2007; Letki, 2008), it is unclear which of these characteristics matters most and whether the impact of contextual characteristics is consistent for different aspects of social cohesion. A possible reason for this remaining controversy might be that scholars focused on different geographical regions and have neglected the fact that it is likely that the impact of the community on social cohesion depends on the characteristics of its residents. In this paper, we assess to what extent, and for whom, characteristics of Dutch neighbourhoods and municipalities affect four different aspects associated to social cohesion: contact frequency with one's neighbours, tolerance to a neighbour from a different race, generalized social trust and volunteering.

Much attention has been paid to the negative impact of (ethnic and economic) heterogeneity on social cohesion. Supposedly, individuals are less likely to connect to each other socially in heterogeneous communities than in homogeneous communities (Alesina and La Ferrara, 2002). This is explained by the homophily principle: people prefer to interact with others who share the same ethnic heritage, have the same social status and hence share experiences and tastes. Whereas some stress the importance of economic heterogeneity within communities (Uslaner and Brown, 2005), others argue that particularly ethnic heterogeneity within local communities erodes social cohesion (Putnam, 2007; Stolle *et al*, 2008). Evidence for the negative effect of locality heterogeneity on social cohesion has been largely confined to the United States and is scarce in Europe. Hence, our first research question reads: *To what extent is social cohesion affected by ethnic and economic heterogeneity within neighbourhoods and municipalities in the Netherlands?*

Despite the strong, recent emphasis on ethnic heterogeneity, the general tenability of the heterogeneity hypothesis is by no means clear. Letki (2008) shows convincingly that in British neighbourhoods it is foremost economic deprivation and not ethnic heterogeneity that erodes social cohesion. Economically deprived localities, criminal localities and localities with high residential mobility rates offer their inhabitants less opportunities for social interaction. Within these localities, circumstances make that contacts between people are not generally positive, making inhabitants more careful, fearful and less familiar with each other (Small and Newman, 2001; Sampson *et al*, 2002). This leads to our second research question: *To what extent is social cohesion*



affected by economic deprivation, crime rates and residential mobility within neighbourhoods and municipalities in the Netherlands? Ethnic and economic heterogeneity often go hand in hand with crime rates, and residential mobility. To assess the unique impact of different locality characteristics it is necessary to take them into account simultaneously.

From a theoretical perspective, locality characteristics are likely to have a different impact across social groups. In line with the homophily principle, living in close proximity to ethnic minorities might not be such a big deal for ethnic minorities themselves, while for natives, higher levels of ethnic heterogeneity might be much more threatening. Moreover, as we will argue below, for individuals with low income and educational levels, living in an ethnically heterogeneous, economically deprived or otherwise disordered locality is often not based on free choice (that is, preferences), but on economic necessity. The impact of neighbourhood and municipality characteristics might thus be stronger for the poor and low educated than for the rich and high educated. To our knowledge the differential effect of contextual characteristics across social groups has been neglected so far. Our final research question is: *To what extent does the relationship between locality characteristics and social cohesion vary across individuals with different income and educational levels and across ethnic groups?*

Empirically, we focus on the Netherlands, which has traditionally been a high trust, highly engaged country. Such an analysis is the more interesting, as the Netherlands differs profoundly from the United States in terms of heterogeneity: economic inequality is lower, and the Netherlands have witnessed a very different, much more recent migration history. In the Netherlands, data have been recorded in great detail both at the individual level (through survey data) and at the contextual levels (through statistics from the Dutch Statistical Office and official police data).

Yet, a systematic test of the impact of theoretically interesting – and tightly collected – locality characteristics on different aspects of social cohesion has been scarce in Europe (but see Letki, 2008 for Britain and Lancee and Dronkers, 2008 for a preliminary trial for the Netherlands). Our focus on the Dutch case thus enables us to replicate previous, mainly American studies. However, this contribution is more than a replication. First, previous studies on the impact of the local community on social cohesion predominantly focused on one aspect of social cohesion, most often on (general or particular) social trust (for example, Alesina and La Ferrara, 2000; Putnam, 2007). In this contribution we employ four indicators of social cohesion: contact frequency with one's neighbours, tolerance to neighbours from a different race, generalized social trust and volunteering. Second, the explanatory model of this contribution is broader in scope than previous research as well, as we take into account the following locality characteristics: (ethnic and economic) diversity, mean income levels, crime rates and residential mobility,



simultaneously. For example, this allows us to disentangle effects due to economic heterogeneity and poverty. Third, whereas most previous studies looked at the impact of a single relatively large geographical unit such as states or countries, we investigate the impact of two smaller geographical units simultaneously: neighbourhoods and municipalities. Below, we use the label 'localities' to refer to both neighbourhoods and municipalities. Finally, we build on previous research by placing more emphasis – theoretically and empirically – on the possibility that the impact of the locality may vary across the residents they inhabit. We will investigate to what extent the living environment influences our indicators of social cohesion differently for individuals from different ethnic backgrounds, with different income levels and with different levels of education.

Context effects are likely to be most pronounced at the neighbourhood level, being the most direct geographical environment in which we assume that people spend most of their social time. However, community life does not exclusively take place in neighbourhoods. Soccer clubs, churches and so on may be situated outside one's direct neighbourhood. Similarly, friends may very well live in different neighbourhoods but within the same city. Living in a homogenous and prosperous neighbourhood may not be enough to shield oneself from the influence of an otherwise heterogeneous and deprived municipality. We therefore expect similar contextual effects at the municipality level as at the neighbourhood level. Note that the only way to test whether observed municipality effects are in reality due to experiences within neighbourhoods is to employ a three-level design (that is, individual, neighbourhood and municipality), which is exactly what we will do.

At the individual level, participating in voluntary organizations and having dense social networks is beneficial for many reasons; among others it (supposedly) stimulates physical and mental health, and boosts one's economic career (Wilson, 2000; Ruiter and De Graaf, 2009). At the aggregate level, social cohesion (for example, associative life and trust) is desirable since it (supposedly) improves inter-ethnic relations, enhances the quality of public and civic life, promotes economic growth and makes democracy work (Putnam 1993; Knack and Keefer 1997; Halpern, 2005). It is therefore not surprising that governments put much effort in developing policy measures that aim to improve locality characteristics and thereby enhancing social cohesion. For this, it is important to empirically assess *which* locality characteristics affect *which* aspects of social cohesion and for *whom*.

Predictions: Heterogeneity, Conflict and Bad Neighbourhoods

Heterogeneity

The homophily principle (Lazarsfeld and Merton, 1954; Blau, 1977) has found impressive support in a wide array of sociological and psychological studies



(McPherson *et al*, 2001). People like others that resemble themselves and have the tendency to associate with these similar others, while they have a 'natural aversion to heterogeneity' (Alesina and La Ferrara, 2002). Similarity and familiarity facilitate interpersonal relations (Kalmijn, 1998). Vice versa, when people living in the same community have less in common with each other, they are less likely to identify with each other (Lehning, 1998), and are therefore less likely to connect to each other socially (Alesina and La Ferrara, 2002). Lehning (1998, p. 238) claimed that 'the greater the number and diversity of persons in a group, the more that universalistic norms require altruism, and yet – at the same time – the weaker the force of altruism'. According to Putnam (2007), heterogeneity of the environment does not only affect the relations between individuals of different social groups negatively, but may even deteriorate cohesion between members of the same social group.

The recent scientific debate especially emphasizes the detrimental effect of *ethnic* heterogeneity on social cohesion. In ethnically diverse communities, inhabitants share less cultural characteristics. Cultural differences complicate the inter-ethnic dialogue, and language differences literally may cause people not to understand each other. This may lead to lower levels of trust (Alesina and La Ferrara, 2002; Stolle *et al*, 2008) and participation (Putnam, 2007; Letki, 2008).

The literature on ethnic exclusionism takes a different spin on why ethnic heterogeneity would affect social cohesion. According to conflict theories (Coser, 1956; Olzak, 1992; Quillian, 1995; Coenders and Scheepers, 1998; Bobo, 1999) larger ethnic outgroup size produces feelings of ethnic threat, be it economically or culturally, and thereby stimulates negative outgroup attitudes. In contrast, the contact theory (Allport, 1954; Pettigrew and Tropp, 2006) poses that the size of ethnic outgroups in a community stimulates contact whereby prejudicial attitudes are reduced. Both contact theory and conflict theory make an explicit distinction between attitudes towards the (ethnic) ingroup and outgroup, which are supposedly communicating vases (Sumner, 1906). However, a positive ingroup bias is not necessarily accompanied with outgroup hate (Allport, 1954; Brown, 2000). Sniderman *et al* (2000) posed that whatever deteriorates trust in general also increases hostility towards ethnic outgroups. And according to Putnam's constrict proposition, the proximity of ethnic outgroups would deteriorate trust in both the ethnic outgroup *and* ingroup (Putnam, 2007).

Several cross-regional studies in the United States provide evidence for the claim that within ethnic heterogeneous communities, people are less likely to trust each other or perform joint activities (Alesina and La Ferrara, 2002; Putnam, 2007). Although in European countries the relative size of non-EU citizens levels is related to higher levels of ethnic exclusionism (Scheepers *et al*, 2002; Semyonov *et al*, 2006), support for the ethnic heterogeneity approach on other aspects of social cohesion in Europe is scarce (Letki, 2008). European



countries with a higher level of ethnic heterogeneity, or a higher share of immigrants, do not show less social cohesion (Hooghe *et al.*, 2009; Gesthuizen *et al.*, 2009).

In a study of British neighbourhoods, Letki (2008) finds a negative effect of ethnic heterogeneity for neighbourhood attitudes, but no effect for structural aspects of social cohesion (sociability, associational involvement and informal help provision). In the Netherlands, at the municipality level, the proximity of ethnic minorities is negatively related to ethnic exclusionism, however, at the neighbourhood level the findings are mixed (Tolsma *et al.*, 2008). Ethnic heterogeneity may thus not have the same effects on different aspects of social cohesion and the impact of ethnic heterogeneity may depend on the geographical locality considered. Nevertheless, building on the general conclusions for the United States, we formulate the following hypothesis:

Hypothesis 1: The larger the ethnic heterogeneity in localities, the less social cohesion.

Dissimilarity in economic resources may also cause people to have problems cooperating, trusting and predicting each others' behaviour. The lifestyles of the rich and the poor differ profoundly; there are marked differences in, for example, economic and cultural consumption and sporting activities. The rich and the poor have been socialized in different social classes and other contexts. Differences in economic resources thus result in less shared experiences and less shared norms. The larger the economic heterogeneity, the more cultural dissimilarity, the larger the barriers across social groups, and the less citizens will be able to identify with each other. The end result will be less social cohesion.

The claim that economic heterogeneity reduces social cohesion has found support in several cross-national studies (Rothstein and Uslaner, 2005; Uslaner and Brown, 2005; Van Oorschot and Arts, 2005; Gesthuizen *et al.*, 2009), as well as in cross-regional studies in the United States (Alesina and La Ferrara, 2002; Putnam, 2007). Yet, the relationship between economic heterogeneity and social cohesion has been less regularly examined at the local level in European countries. We formulate the following hypothesis:

Hypothesis 2: The larger the economic heterogeneity in localities, the less social cohesion.

Deprived communities

Next to the degree of heterogeneity, communities differ in the extent to which they offer their inhabitants the resources to meet and mingle. These resources encompass well-equipped alters, infrastructure, a safe and trustworthy environment, and residential stability. Without such resources it will be more



difficult for social cohesion to arise (Völker *et al*, 2007). Moreover, such communities generate feelings of threat and alienation, which hampers social interactions (Letki, 2008). Social cohesion is least, there where its positive effects are needed the most, namely in disadvantaged communities (Wilson, 1987; Sampson and Groves, 1989; Small and Newman, 2001; Sampson *et al*, 2002; Letki, 2008). A lack of social cohesion may have negative consequences for the quality of the community, which in turn could result in dropping social cohesion rates. Localities may thus get trapped in a vicious circle. Vice versa, advantaged communities may 'accumulate' capital and benefit from a virtuous circle, because of a high level of individual level and collective resources. We distinguish three locality characteristics that may obstruct social cohesion: poverty, criminality and residential mobility.

In economically deprived neighbourhoods, people experience less instrumental help, have less positive role models (Wilson, 1987) and develop lower levels of self-efficacy (Boardman and Robert, 2000). Residents consequently experience less bonding (Brisson and Usher, 2005), have less trust (Ross *et al*, 2001; Li *et al*, 2005) and associate less (Portes, 1998; Browning *et al*, 2004; Halpern, 2005; Putnam, 2007). Crime, too, may be a hindrance for social cohesion (Rosenfeld *et al*, 1999), because people are less likely to trust others when they themselves or acquaintances have been the victim of crime. According to Oliver and Mendelberg (2000, p. 576), exposure to crime 'leads to [...] feelings of anxiety and fear, alienation from neighbours, lack of trust in others, and suspicion towards outgroups in general'. Finally, higher residential mobility rates are also likely to diminish social cohesion. The time people spend in their community stimulates their possibilities to initiate social interaction and subsequently enhance the quality of social relations (Völker *et al*, 2007). Residential mobility destabilizes social networks, both for those who leave the locality and for those who stay behind. Moreover, anticipating on others' residential mobility may be a negative incentive for investing in social relationships. It is therefore more difficult to build up and maintain social ties when the composition of a community is unstable. All these symptoms of a 'bad' locality were significant determinants of social cohesion in Putnam's recent study (Putnam, 2007), but have not been tested simultaneously in the Netherlands. We expect that:

Hypothesis 3: The more (a) poverty, (b) criminality, and (c) residential mobility in localities, the less social cohesion.

Who is affected?

Up to this point we have focused on the question *which* contextual characteristics matter. At least as interesting is the question *for whom* these



contextual characteristics matter. Yet, although localities have repeatedly been put forward as important contexts for social cohesion (Sampson *et al*, 2002; Putnam, 2007; Völker *et al*, 2007), the argument for whom is less well developed. Nevertheless, differential effects of contextual characteristics are to be expected – primarily between the rich and the poor as well as between the relatively high and low educated.

Compared to individuals with higher incomes, individuals with low incomes will be relegated to localities less by choice than by economic necessity. For rich citizens that do not like their local environment (due to heterogeneity or bad neighbourhood quality), leaving the locality is a viable option (Massey *et al*, 1994). Those who are content with their local environment stay. This selective migration may obscure the contextual effects for the rich, but not (or at least less so) for the poor – who are more likely to lack the option to move. Moreover, especially the relatively high educated express less ethnic hostility, higher feelings of trust and adhere more to a cosmopolitan worldview. Given these known relationships between educational level and social cohesion, we expect that the homophily principle might be less applicable to them. Instead, the high educated may prefer to live in a diverse locality, at least more so than individuals with lower educational degrees. People are to some extent confined to live in a specific municipality because of working or family obligations, for example. However, within a municipality they will choose the neighbourhood most to their liking within the limits of their economic resources. Differential effects of locality characteristics across the rich and the poor and the high and low educated should thus be most apparent on the neighbourhood level.

Finally, the literature on ethnocentrism suggests that locality characteristics may have a stronger impact on ethnic hostility for the poor and low educated than for the rich and high educated, as especially poor and low educated residents are in direct competition with ethnic minorities in ethnic heterogeneous and deprived localities (Quillian, 1995; Tolsma *et al*, 2008).

Empirically, it has been shown that the poor are more likely to be influenced in pro-social behaviour than the rich (Van der Meer *et al*, 2009). And as shown by Tolsma *et al* (2008), the impact of the proportion of ethnic outgroups within one's neighbourhood increases ethnic exclusionism among the low educated, but decreases ethnic exclusionism among the high educated. Given these theoretical considerations and empirical findings we formulate the hypothesis:

Hypothesis 4: Locality characteristics have a stronger detrimental effect on social cohesion for the poor and low educated than for the rich and high educated.¹

Ethnic heterogeneity may not be perceived in the same way by different ethnic groups. For native Dutch, increasing heterogeneity in localities is



generally synonymous to increasing ethnic *outgroup* sizes. However, this is generally not the case for ethnic minority groups; for them, a larger *ingroup* size increases ethnic heterogeneity. We expect that:

Hypothesis 5: Ethnic heterogeneity has a stronger negative effect on social cohesion for the native Dutch, than for non-natives.

Data and Measurement

Our hypotheses call for a multi-level design as we distinguish between three levels of analysis: individuals, neighbourhoods and municipalities. This distinction is well captured by the survey data of 'Culturele Veranderingen 2004' (Cultural Changes 2004) of the Netherlands Institute for Social Research (www.scp.nl). This data set has several additional advantages. Firstly, it contains a large amount of measures associated with social cohesion. Secondly, besides a representative sample, underprivileged neighbourhoods were over-sampled, thereby increasing variance in locality characteristics. Furthermore, this sampling procedure resulted in a large percentage of respondents of non-Dutch origin in our data set (25 per cent).

We distinguish between the neighbourhood and the municipality as relevant geographical contexts for social cohesion. In the Netherlands, complete zip codes have four digits and two letters. Parts of streets have distinct zip codes. From here on, we use the word neighbourhood as synonym for the four-digit part of the zip code. On average, approximately 4000 persons share the same four digits of their zip code. Neighbourhoods are nested in larger geographical units, municipalities. We test our hypotheses on a data set of 2949 individuals living in 503 neighbourhoods and 245 different municipalities.

Measures of social cohesion

The four indicators of social cohesion are measured at the individual level. Although we acknowledge that social cohesion is a characteristic of a group, these four indicators all refer to the way individuals are tied to fellow citizens. The frequency of *contact with one's neighbours* was measured by an ordinal scale. We recoded it into the number of days per year. *Tolerance to neighbours from a different race* was measured by the survey question whether it would bother the respondents if they would get neighbours from a different race. Answer categories were: 1: I would oppose; 2: It would be less comfortable; 3: Depends; 4: No objection at all. Higher scores thus represent less opposition and hence more tolerance to a neighbour from a different race. Notably, ethnic



minorities received the same questions as the native Dutch. *Voluntary work* is operationalized as doing voluntary work for at least one of 11 types of associations.² *General social trust* is measured through the standard dichotomous question: Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people? Although all indicators of social cohesion, they are not strongly correlated; the strongest correlation was observed between tolerance to neighbours from a different race and general social trust (Pearson correlation 0.13, $P = 0.00$). This underlines the importance of analysing indicators of social cohesion separately.

Individual level determinants: Background characteristics

While testing the effects of citizens' direct environment on social cohesion, we need to take other explanations into account. Previous studies showed, for instance, that citizens with more resources (income, education) are more likely to be happy with their direct environment, trust others and participate socially. In sum, we control for the following factors at the individual level: age, sex, marital status, household composition, level of education, level of income, work status, health status, denomination, church attendance and ethnic origin. To deal with missing values on these determinants, we assigned the respective average scores to interval level variables and included an extra category 'missing' to nominal level variables.

Context characteristics

Our measure of *ethnic heterogeneity* is based on the Herfindahl Index (HI): $1 - HI$. We hereby use the same measure for ethnic heterogeneity as other recent studies on the relationship between contextual characteristics and social cohesion (Alesina and La Ferrara, 2000, 2002; Anderson and Paskeviciute, 2006; Hooghe *et al*, 2009; Putnam, 2007; Gesthuizen *et al*, 2009). The ethnic heterogeneity measure estimates the chance that two randomly chosen individuals in the population have a different ethnic background. We distinguish three main ethnic background categories: native Dutch, non-western immigrants and western immigrants, which constituted 81 per cent, 10 per cent and 9 per cent of the Dutch society in 2004, respectively.³ In the Netherlands, the most important non-western immigrant groups are Turks (21 per cent), Moroccans (19 per cent), Surinamese (20 per cent) and Antilleans (7 per cent). The most important western-immigrants are Germans.

We used the Gini-coefficient as our indicator for *economic heterogeneity* within neighbourhoods and municipalities. The value 0 corresponds to perfect equality (homogeneity) and 1 with perfect inequality (heterogeneity).



To construct the Gini-coefficient, we used the mean nominal income of the complete zip code (that is, parts of streets; on average 40 persons), as collected by Statistics Netherlands. On average the Gini-coefficient for neighbourhoods is based on 109 complete zip codes, the Gini-coefficient for municipalities on 907 complete zipcodes.⁴

To capture the economic status of the neighbourhood and municipality we used the *mean income*, as collected by Statistics Netherlands.

We used the Dutch Police Population Monitor waves 1999, 2001 and 2003 to obtain the number of burglary victims per 1000 residents in the locale. The number of recorded offences in the time period 2000–2004 per 1000 residents has been derived from official crime statistics. The number of criminal suspects living in each locality (per 1000 residents) has been derived from official crime statistics as well. We calculated the standardized sum score of these three distinct crime measures to construct a single indicator of *crime*.⁵

Finally, the *residential mobility* of a locale is a sum score of all people who moved *within* a locale plus half the sum of movers *out of*, and *into* a locale in 2004, divided by the total inhabitants of the locale.

Note that because of our unique data, all neighbourhood characteristics are measured at the correct level, the four-digit zip code. We, thus, did not use characteristics of larger localities as proxies for neighbourhood characteristics. Descriptive statistics for both individual level variables and contextual level variables may be found in Appendix A. In order to facilitate interpretation of the cross-level effects, we centred the involved variables (accept for ethnicity) around their respective grand (sample) mean values. Correlations between the context variables are summarized in Appendix B.

Modelling strategy

We employ multi-level analyses to take into account the nesting structure of our data (Snijders and Bosker, 1999). For the metric dependent variables, we estimate hierarchical linear random intercept regression models (with lme4 in R, final results were verified with xtmixed in STATA 10); for the dichotomous dependent variables, multi-level logistic regression models (with lme4 in R, final results were verified with xtmelogit in STATA 10). The estimated variance components are summarized in Appendix C.⁶

It is impossible to estimate all contextual characteristics and proposed cross-level interactions simultaneously. With so many related contextual variables and cross-level interaction variables, we would experience problems of collinearity. It is also undesirable to include all contextual characteristics simultaneously, because the inclusion of irrelevant contextual variables will cause standard errors to be needlessly large. We deal with this problem in two



ways. First, we will investigate the *bivariate* relationships between locality characteristics and social cohesion. Second, to come to our final *multivariate* explanatory models we will follow a stepwise procedure. We start with a base model that included all individual level characteristics but no locality characteristics. As a criterion for entry and removal of contextual characteristics we use the significance of the parameter estimates, respectively, $\alpha < 0.10$ and $\alpha > 0.10$, two-tailed. The order of introduction is determined by the improvement of the model fit as indicated by the likelihood value.⁷

Results

Bivariate relationships between locality characteristics and social cohesion

The bivariate relationships between, on the one hand, neighbourhood and municipality characteristics and on the other hand our indicators of social cohesion are summarized in Table 1. The values in Table 1 refer to the parameter estimates of hierarchical random intercept regression models in which only the contextual characteristic of interest is included. At the neighbourhood level, ethnic heterogeneity is negatively and significantly related to contact frequency with one's neighbours ($b = -13.31$), generalized trust ($b = -0.54$) and volunteering ($b = -2.04$). In economically advantaged neighbourhoods, residents have more frequently contact with their neighbours ($b = 3.72$), higher levels of generalized trust ($b = 0.68$) and participate more in voluntary work ($b = 0.58$). Crime and residential mobility in one's neighbourhood are negatively related to contact frequency with one's neighbours and voluntary work (Table 1). So far the bivariate relationships between neighbourhood characteristics and social cohesion are in agreement with our predictions.

On the other hand, economic inequality within the neighbourhood as operationalized by the Gini coefficient is not negatively related to any of our distinguished aspects of social cohesion. Moreover, ethnic heterogeneity, crime and residential mobility are positively related to tolerance to neighbours from a different race. Although somewhat surprisingly from the constrict proposition (Putnam, 2007), these latter findings are in line with the bivariate relationships as reported by Tolsma *et al* (2008) and with respect to ethnic diversity, they support the contact theory.

When we look at the relationships between characteristics at the municipality level and our indicators of social cohesion, we mainly find similar results. However, there are also some striking differences. Whereas economic heterogeneity at the neighbourhood level is not negatively related to any of our indicators of social cohesion, at the municipality level it is related to less contact with neighbours and lower levels of volunteering, in line with our

Table 1 Bivariate relationships between locality characteristics and indicators of social cohesion^a

	<i>Contact neighbours</i>		<i>Tolerance neighbours different race</i>		<i>Generalized trust</i>		<i>Voluntary work</i>	
	<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>
<i>Neighbourhood characteristics</i>								
Ethnic heterogeneity	-13.31	4.66**	0.64	0.15**	-0.54	0.32~	-2.03	0.31**
Economic heterogeneity	-23.04	20.02	0.73	0.57	5.53	1.34**	0.34	1.36
Mean income	3.72	1.86*	-0.03	0.05	0.68	0.13**	0.58	0.13**
Crime	-5.28	1.97**	0.10	0.06~	-0.10	0.13	-0.51	0.14**
Residential mobility	-62.78	17.23**	2.28	0.53**	0.39	1.19	-7.47	1.21**
<i>Municipality characteristics</i>								
Ethnic heterogeneity	-14.02	5.18**	0.72	0.19**	-0.13	0.36	-2.33	0.35**
Economic heterogeneity	-58.87	24.31*	0.97	0.82	1.57	1.63	-5.97	1.77**
Mean income	-1.09	3.27	-0.17	0.10	0.12	0.22	0.19	0.23
Crime	-1.02	0.51*	0.05	0.02**	0.00	0.03	-0.21	0.03**
Residential mobility	-58.96	26.98*	3.36	0.95**	0.67	1.82	-10.99	1.82**

^aParameter estimates of hierarchical random intercept regression models in which only the contextual characteristic of interest is included.

~0.10; *0.05; **0.01 (two-tailed).

predictions. And although mean income at the neighbourhood level is fairly consistently related to more social cohesion, mean municipality income is not related to any of our indicators of social cohesion.

The unique impact of locality characteristics on dimensions of social cohesion

The results discussed so far referred to bivariate relationships between contextual characteristics and our indicators of social cohesion. The observed relationships may, however, be due to composition effects. In this case, individuals living in these localities are more (or less) likely to have pro-social attitudes or display social behaviour because of their *own* characteristics instead of characteristics of their local environment. Moreover, as locality characteristics are correlated we need to include (relevant) contextual characteristics simultaneously into our explanatory models. Finally, since we assumed that contextual characteristics may have a different impact across ethnic, income or education groups, we need to take into account possible cross-level interactions. Our multi-variate hierarchical random intercept regression models with cross-level interactions with which we test our hypotheses are summarized in Table 2. The presented main effects of locality characteristics indicate the general (or mean) effect within the population on social cohesion. The cross-level interactions show to what extent the impact of locality characteristics is conditional on individual-level characteristics.

**Table 2** Relationships between locality characteristics and indicators of social cohesion^a

	<i>Contact neighbours</i>		<i>Tolerance neighbours different race</i>		<i>Generalized trust</i>		<i>Voluntary work</i>	
	<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>
<i>Individual characteristics</i>								
Intercept	17.52	3.96**	3.52	0.10**	-0.65	0.27*	-1.97	0.28**
Income (in 1000 euros)	-0.33	0.62	0.03	0.02*	0.20	0.05**	0.05	0.04
Education (in years)	-0.55	0.22*	0.03	0.01**	0.14	0.02**	0.09	0.02**
Ethnicity (Dutch = reference)								
Surinamese	-1.34	4.42	0.29	0.11*	-0.77	0.32*	-0.20	0.32
Antilleans	10.60	6.44	0.26	0.17	-1.01	0.51*	-0.20	0.49
Indonesian	-7.67	3.68*	0.31	0.10**	-0.63	0.26*	-0.02	0.26
Turks	12.93	6.26*	0.06	0.16	-0.68	0.44	-0.19	0.47
Moroccans	6.60	6.91	0.35	0.17*	-0.10	0.47	-0.39	0.54
Age × 10	0.29	0.05**	0.00	0.00*	0.00	0.00	0.01	0.00*
Men (female = reference)	-1.19	1.24	-0.03	0.03	0.02	0.08	0.02	0.09
Unemployed (employed = reference)	2.53	1.52~	-0.11	0.04**	-0.09	0.10	0.03	0.11
Health (no denomination = reference)	2.27	0.86**	0.01	0.02	0.33	0.06**	0.24	0.06**
Catholic	1.24	1.84	-0.14	0.05**	-0.22	0.12~	0.07	0.13
Liberal Protestants	3.70	2.66	-0.10	0.07	0.02	0.18	0.33	0.18~
Orthodox Protestants	0.69	3.26	0.02	0.08	0.35	0.22	0.57	0.23*
Islam	-8.03	5.40	0.19	0.13	0.14	0.36	-0.32	0.41
Church attendance	0.08	0.05~	0.00	0.00	0.00	0.00	0.02	0.00**
Household composition (single no children = reference)								
Single parent	7.51	2.68**	0.00	0.07	-0.61	0.18**	0.62	0.19**
Married no children	6.41	1.86**	-0.05	0.05	-0.32	0.12**	0.25	0.13~
Married with children	9.93	1.89**	-0.05	0.05	-0.21	0.13~	0.60	0.13**
Unmarried couple no children	4.70	3.02	-0.09	0.07	-0.01	0.21	-0.60	0.23**
Unmarried couple with children	3.96	3.46	0.00	0.09	-0.20	0.23	0.08	0.24
<i>Neighborhood characteristics; main effects and cross-level interactions</i>								
Ethnic heterogeneity	3.08	8.32	0.52	0.15**	—	—	—	—
Ethnic heterogeneity × income	8.79	3.77*	-0.26	0.09**	—	—	—	—
Economic heterogeneity	-34.62	23.86	—	—	1.52	1.59	—	—
Economic heterogeneity × income	—	—	—	—	-2.65	1.12*	—	—
Economic heterogeneity × education	-9.53	5.59~	—	—	—	—	—	—
Mean income	7.21	2.46**	—	—	0.30	0.18~	0.24	0.14~
Residential mobility	—	—	—	—	—	—	-2.75	1.47~
<i>Municipality characteristics; main effects and cross-level interactions</i>								
Ethnic heterogeneity	-14.63	9.90	—	—	0.28	0.36	-1.09	0.39**
Ethnic heterogeneity × education	-4.67	1.94**	—	—	0.24	0.09*	—	—
Mean income	—	—	-0.29	0.09**	-0.67	0.27*	—	—
Mean income × income	—	—	—	—	0.33	0.19~	—	—
Residential mobility	61.53	39.66	—	—	—	—	—	—
Residential mobility × education	19.97	10.74~	—	—	—	—	—	—

^aControls variables also included in the model but not show: dummy variables indicating imputation of missing values; other category for: ethnicity, household composition, and denomination.

~0.10; * 0.05; ** 0.01 (two-tailed).



Before we turn to the impact of locality characteristics, we briefly discuss the effects at the individual level for which we hypothesized that contextual characteristics may have different effects (that is, which have been used in cross-level interactions), namely income, education and ethnicity. Compared to native Dutch, Antilleans and Turks have more and Indonesians have less contact with their neighbours. In general, ethnic minority groups express more tolerance to neighbours from a different race (although only the parameter estimates for Surinamese and Indonesians reach significance). Ethnic minority groups have lower levels of generalized trust than native Dutch but do not participate more or less in voluntary associations. The higher one's income, the lower the contact frequency with neighbours, the more tolerance to a neighbour from a different race, and the higher one's feelings of generalized trust. People with higher levels of education have less contact with their neighbours, express more tolerance to neighbours from a different race, have higher levels of trust and participate more in voluntary work. These main effects of ethnicity, income and education on our dimensions of social cohesion are firmly in line with previous research (Tolsma *et al*, 2008; Gesthuizen *et al*, 2009). The parameter estimates of our other control variables at the individual level (age, sex, employment status, health, religiosity and household composition) did not lead to surprising results.

In general, after controlling for individual level characteristics and by taking into account contextual characteristics simultaneously, we find far less support for our hypotheses stating that (ethnic or economic) heterogeneity, poverty, crime or residential mobility negatively affect social cohesion. Compared to Table 1, much fewer (main) effects of locality characteristics reached significance.

Perhaps most strikingly, ethnic heterogeneity at the neighbourhood level is no longer negatively related to any of our indicators of social cohesion. Ethnic heterogeneity at the neighbourhood level is even significantly positively related to contact with neighbours for residents with income levels above average (as indicated by the significant cross-level interaction, $b = 8.79$, $se = 3.77$) and to tolerance to neighbours from a different race (the main effect is 0.52 ($se = 0.15$)), especially for residents with income levels below average (the cross-level interaction is -0.26 ($se = 0.09$)). Ethnic heterogeneity at the municipality level is also positively and not negatively related to generalized trust for residents with educational levels above average ($b = 0.24$, $se = 0.09$). The only effects of ethnic heterogeneity in line with our predictions are that ethnic heterogeneity within municipalities is negatively related to voluntary work ($b = -1.09$, $se = 0.39$) and negatively related to contact with neighbours for the high educated (as indicated by the cross-level interaction $b = -4.67$, $se = 1.94$). All in all, we thus find little support for Hypothesis 1.



Economic heterogeneity within neighbourhoods or municipalities does not consistently negatively affect social cohesion either, contrary to our second hypothesis. Economic heterogeneity of the neighbourhood only reduces contact with neighbours for the high educated (as indicated by the significant cross-level interaction, $b = -9.53$, $se = 5.59$) and reduces generalized feelings of trust for residents with income levels above average (as indicated by the significant cross-level interaction, $b = -2.65$, $se = 1.12$).

Instead of economic heterogeneity it is economic affluence that influences social cohesion; the most consistent finding is that the economic affluence of neighbourhoods is positively related to social cohesion. If the mean income level of a neighbourhood increases with 1000 euros, residents see their neighbours seven times more a year ($b = 7.21$, $se = 2.46$). This effect is substantial even in comparison to significant individual level characteristics. In more affluent neighbourhoods, generalized feelings of trust are higher as well ($b = 0.30$, $se = 0.18$) and residents participate more in voluntary work ($b = 0.24$, $se = 0.14$). At the neighbourhood level, we find a lot of corroborative evidence for Hypothesis 3a. On the other hand, in more affluent municipalities, residents have, in general, lower levels of tolerance to neighbours from a different race ($b = -0.29$, $se = 0.09$). The mean income of the municipality is also negatively related to feelings of trust and especially so for residents with low-income levels (the main effect is $b = -0.67$, $se = 0.27$; the cross-level interaction is $b = 0.33$, $se = 0.19$).

Crime rates within localities and municipalities are not related to our indicators of social cohesion, once we control for composition effects and other relevant locality characteristics. Therefore, we reject Hypothesis 3b. Residential mobility at the neighbourhood level reduces the likelihood to participate in voluntary work ($b = -2.75$, $se = 1.47$). But, overall, there is little support for Hypothesis 3c. Somewhat surprisingly, residential mobility at the municipality level is even positively related to contact with neighbours for the high educated (as indicated by the cross-level interaction $b = 19.97$, $se = 10.74$).

Several general patterns thus emerge. Firstly, not all contextual characteristics are equally important. Economic deprivation within neighbourhoods is most clearly negatively related to social cohesion. Secondly, we find substantial differences in explanatory models between the dimensions of social cohesion. For the dependent variable tolerance to neighbours from a different race, the contextual characteristics are consistently related in the opposite direction as predicted by the heterogeneity and deprivation propositions. Thirdly, the effects of many contextual characteristics on social cohesion are conditional on residents' income or educational level. However, the assumed detrimental effect of locality heterogeneity and deprivation is not consistently stronger for the poor or low educated than for the rich or high educated. The effect of ethnic diversity does not depend on residents' ethnicity. We have to reject Hypotheses 4 and 5.



On the lack of consistent negative effects of ethnic diversity

We failed to find support for Hypothesis 1, according to which social cohesion would be less in ethnically more diverse localities. By contrast, many American studies did find such an effect. Do the Netherlands really differ from the United States in this respect, or are other problems at play? One important issue is that the interpretation of observed relationships between ethnic diversity (as measured by the complement of the HI) is not always clear. The HI is 'colourblind'. It is impossible to translate the value of the HI to the real ethnic composition of the locality. For example, a HI of 1 simply means there is one ethnic group present in the locality, although it does not tell which group this is. See also Voas *et al* (2002) for a discussion of problems related to the HI.

The precise ethnic composition of a locality might matter at least as much as the more abstract idea of ethnic heterogeneity. However, the size of the native Dutch is strongly correlated to ethnic diversity (Pearson's correlation > 0.90). Consequently, in the Netherlands, it is impossible to pull effects of ethnic diversity and the size of the dominant ethnic group apart. Nevertheless, additional analyses (results available on request) rule out two alternative explanations for the relationships between ethnic heterogeneity and social cohesion that we did observe: they are not caused by the size of your own ethnic group (that is, the percentage of Turks for Turks, the percentage of native Dutch for native Dutch) nor to the presence of one *specific* ethnic minority group. Note that the (interpretation) problems related to ethnic diversity affect most previous research. For example, for the United States, it might not necessarily be diversity that negatively affects social cohesion, but percentages of whites, blacks or Latinos in the locality. Future research is thus warranted.

Conclusion

In this paper we raised three research questions regarding locality effects on social cohesion. The first asked to what extent social cohesion is affected by ethnic and economic heterogeneity within neighbourhoods and municipalities in the Netherlands. The second asked to what extent social cohesion is affected by economic deprivation, crime rates and residential mobility within neighbourhoods and municipalities in the Netherlands. We distinguished four aspects associated to social cohesion: contact frequency with one's neighbours, tolerance to a neighbour from a different race, generalized social trust and volunteering.



The mean income of the neighbourhood turns out to be the most important contextual characteristics. More specifically, we found that in more prosperous neighbourhoods, residents have more contact with their neighbours, have higher levels of trust and are more likely to do voluntary work. A second consistent finding is that crime rates do not affect social cohesion. Economic heterogeneity at the locality level does not have a consistent negative effect on social cohesion in the Netherlands. Similarly, residential mobility does not have a consistent negative effect on social cohesion either. And although Putnam (2007) reports that – in line with his constrict proposition – ethnic heterogeneity has a negative impact on all forms of social cohesion in the United States, we come to a radically different conclusion. In the Netherlands, ethnic heterogeneity does not have a uniform negative effect on social cohesion: whereas it diminishes some forms of social cohesion – at the municipality level it is negatively related to the propensity to do voluntary work, it stimulates others; tolerance to neighbours from a different race is higher in ethnically heterogeneous neighbourhoods.

The answers to these research questions have important implications. First, given that locality characteristics affect different aspects of social cohesion differently, it is imperative that social cohesion is not reduced to one single indicator, let alone that different dimensions are simply aggregated. The overarching concept of social cohesion is not easily reduced to one or two indicators. Second, all in all we find little support for the homophily principle, at least when it comes to the expected impact of locality characteristics. At the locality level there is no consistent effect that ethnic or economic heterogeneity hinders social cohesion: living among dissimilar others does not consistently weaken one's pro-social attitudes or undermine one's social behaviour. Coffé and Geys (2006) came to similar conclusions for economic heterogeneity in Flemish municipalities.⁸ Possibly, even though citizens might prefer contacts with similar others, when they have less (but still some) opportunities to do so, they do not participate less or have more negative attitudes.

The third question we set out to answer was to what extent the relationships between locality characteristics and social cohesion vary across individuals. Ethnic heterogeneity within localities does not have a differential impact on social cohesion across ethnic groups. Also contrary to our predications, detrimental effects of locality characteristics are not always weaker for the rich and high educated than for the poor and low educated. Sometimes they are even stronger (for example, economic heterogeneity is negatively related to trust for the rich but positively for the poor). We conclude that it is important to take into account that the impact of locality characteristics is conditional on individual level characteristics. However, it remains unclear why this is so. Our results show that the conditional effects of locality characteristics across income and educational groups are not (only) the result of residential mobility.



Still, we cannot rule out – and it is indeed very likely – that locality characteristics trigger selective residential mobility: not only the attitudes of the remaining residents change as a result of specific locality characteristics, but residents may selectively move in or out of the locality as well. At the locality level, residential mobility is most strongly related to ethnic heterogeneity. If especially ethnic heterogeneity triggers (or has triggered) selective residential mobility, this may explain why especially our findings regarding tolerance to a neighbour from a different race are in the opposite direction as expected.

We coped with the issue of selective residential mobility in two ways. First, we assumed that especially the rich have the economic opportunity to selectively select their place of residence and that the high educated may prefer to some extent to live in heterogeneous communities. Hence, we expected that negative effects of localities should be stronger for the poor and low educated than for the rich and high educated. As said before, in general, we did not find corroborative evidence for this line of reasoning. Ethnic heterogeneity is not negatively related to tolerance in our sample, not for the poor and not for the rich. This contradicts previous findings of Tolsma *et al* (2008). Second, we assumed that between small geographical communities, such as neighbourhoods, (selective) residential mobility is more likely to occur than between larger geographical communities, such as municipalities or countries. However, we did not find a consistent negative relationship between ethnic heterogeneity at the municipality level and social cohesion either. Given the relatively low migration rates, selective mobility is likely to be negligible at the country level but even within European countries there is no evidence for a negative relationship between ethnic heterogeneity and levels of social cohesion (Gesthuizen *et al*, 2009). All in all we conclude that although the moderating role of residential sorting on the impact of locality characteristics on social cohesion should be further investigated, it is unlikely that selective residential mobility discredits our conclusions.

Our multi-level analysis showed that the relationships between contextual characteristics and dimensions of social cohesion are to a substantial degree explained by composition effects. Aggregated analyses (like Delhey and Newton, 2005; Coffé and Geys 2006) would not have been able to pull composition effects and true contextual effects apart, while simple O.L.S. regressions (like Putnam, 2007) would underestimate the standard errors of the contextual effects.

This study is the first study on social cohesion that tests for locality effects on a random sample of municipalities *and* neighbourhoods. Both localities turned out to affect social cohesion, as we expected. This implies that looking at ever smaller geographical units or communities like streets or personal networks is not the only way to proceed. Since the impact of specific locality characteristics



on social cohesion is reversed across neighbourhoods and municipalities (for example, the effect of mean income on feelings of trust), the inconsistency in previous research may indeed be owing to the different (regional) units of analysis. Cross-national research is warranted in which the impact of the same regional locality (or localities) on social cohesion is investigated.

This paper implies that (Dutch) policy makers who aim to stimulate social cohesion by changing the local living environment of people had best direct their efforts to improve the mean levels of income within neighbourhoods. They should also be aware that not all residents within localities and dimensions of social cohesion are affected similarly.

Notes

- 1 More specifically, we are more confident to find a detrimental effect of (ethnic and economic) heterogeneity, poverty, crime and residential mobility within localities on social cohesion among the poor and low educated than among the rich and high educated.
- 2 These are singing/music, sports, hobby, political, interest, religious organizations, schools, neighbours/elderly/handicapped, action groups and local community organizations.
- 3 The Herfindahl Index is given by: $HI = \sum_i p_i^2$, where p_i is the proportion of the respective distinguished ethnic group within the locale¹. The measure of ethnic heterogeneity is obtained by taking the complement of the HI: $1 - HI$.
- 4 This operationalization causes an underestimation of the income inequality within neighbourhoods and municipalities and our tests regarding the impact of income inequality should be considered conservative. The definition of the Gini-coefficient as the mean of absolute differences

between all pair of individuals is given by: $\frac{\sum_i \sum_j |y_i - y_j|}{2n^2 \bar{y}}$, where y is the observed income, n the total individuals and \bar{y} the mean income. We calculated the Gini-coefficient by the SPSS-script provided on Raynald's SPSS Tools website (<http://www.spsstools.net/>). As said before, instead of income data at the individual level we use information on the mean income level of the complete zip code to construct the Gini-coefficient. We weighted the complete zip codes by the number of residents.

- 5 We would like to thank L. Prins and his colleagues of the Dutch police force (Korps Landelijke Politiediensten, Dienst Nationale Recherche Informatie, Onderzoek en Analyse) for making these data available to us.
- 6 We applied hierarchical models to obtain correct standard errors of the contextual effects. Since our neighbourhoods are not randomly selected, the intra class correlations are not that informative. However, from Appendix C we learn that the variances at the higher levels are substantial. To a large extent this variance is due to composition effects.
- 7 Note that neither STATA nor R has a build in stepwise model selection procedure. We thank Rense Nieuwenhuis for the help during the estimation procedure in R. See <http://www.rensenieuwenhuis.nl/> for the R script we used to come to our final models as presented in Table 2.
- 8 One plausible theoretical explanation that economic inequality is important at the country level but apparently not at lower contextual levels is that the effect of economic inequality at the country level is mainly driven by institutional fairness perceptions and not so much by the cultural dissimilarity that results from differences in economic resources. These perceptions of



fairness may be forged mainly in national public spheres by political parties and the media and not in local environments such as neighbourhoods and municipalities.

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Appendix A

See Table A.

Table A Descriptive statistics

	<i>N</i>	<i>Range</i>	<i>Percentage (categorical variables)</i>	<i>Mean (interval variables)</i>	<i>Standard deviation</i>
<i>Dependent variables</i>					
Contact neighbours (times per year)	2746	0–78	—	44.85	32.40
Tolerance neighbours different race (It would bother me = 1; not oppose = 4)	2903	0–4	—	2.35	0.85
Generalized trust (people can be trusted = 1)	2871	0–1	53	—	—
Voluntary work (volunteer = 1)	2716	0–1	41	—	—
<i>Independent variables at the individual level</i>					
Age	2949	16–99	—	47.89	17.89
Education (in years)		6–16.5	—	11.00	3.12
Missing values education		—	7	—	—
Sex (male = 1)		—	47	—	—
Income (in 1000 euros)		0.4–10	—	2.10	1.14
Missing values income		—	21	—	—
Working status		—	—	—	—
Employed		—	55	—	—
Not employed		—	45	—	—
Health status (healthy = 4)		1–4	—	2.87	0.77
Missing values health status		—	1	—	—
Denomination		—	—	—	—
No denomination		—	62	—	—
Catholic		—	18	—	—
Liberal Protestants		—	7	—	—
Orthodox Protestants		—	4	—	—
Islam		—	3	—	—



Table A continued

	<i>N</i>	<i>Range</i>	<i>Percentage (categorical variables)</i>	<i>Mean (interval variables)</i>	<i>Standard deviation</i>
Other religion		—	5	—	—
Church attendance (times per year)		0–53	—	9.20	17.19
Household composition					
Single without		—	27	—	—
Married with children		—	32	—	—
Married without children		—	23	—	—
Cohabiting with children		—	4	—	—
Cohabiting without children		—	6	—	—
Single with children		—	7	—	—
Other household composition		—	2	—	—
Ethnicity					
Native Dutch		—	75	—	—
Turks		—	2	—	—
Moroccans		—	1	—	—
Surinamese		—	2	—	—
Antilleans		—	1	—	—
Indonesian		—	3	—	—
Other		—	8	—	—
Refusal		—	9	—	—
<i>Independent variables at the neighbourhood level</i>					
Ethnic heterogeneity (maximum heterogeneity = 0.67)	503	0.04–0.60	—	0.30	0.15
Native Dutch (%)		10.40–98.13	—	0.79	0.16
Western immigrants (%)		1.05–29.83	—	0.09	0.04
Non-western immigrants (%)		0–86.54	—	0.12	0.15
Economic heterogeneity (maximum heterogeneity = 1)		0.06–0.30	—	0.13	0.03
Mean income (in 1000 euros)		1.31–4.46	—	1.97	0.37
Crime (Zscore)		–0.43–1.53	—	0.06	0.35
Victims of burglary (per 1000 respondents)		0–333.33	—	63.19	60.39
Recorded offences (per 1000 residents)		0–3275	—	277.85	281.81



Criminal suspects (per 1000 residents)	—	0–117	—	36.37	17.89
Residential mobility (per 1000 residents)	—	30.00–248.60	—	0.03	0.16
<i>Independent variables at the municipality level</i>					
	245				
Ethnic heterogeneity (maximum heterogeneity = 0.67)	—	0.04–0.59	—	0.23	0.11
Native Dutch (%)	—	52–98	—	0.86	0.08
Western immigrants (%)	—	1–30	—	0.07	0.04
Non-western immigrants (%)	—	1–35	—	0.06	0.05
Economic heterogeneity (maximum heterogeneity = 1)	—	0.10–0.34	—	0.14	0.03
Mean income (in 1000 euros)	—	1.47–3.34	—	1.96	0.27
Crime (Zscore)	—	–1.70–4.18	—	0.35	1.14
Victims of burglary (per 1000 respondents)	—	0–242.42	—	54.50	35.81
Recorded offences (per 1000 residents)	—	0.35–815.97	—	233.56	135.27
Criminal suspects (per 1000 residents)	—	13.09–60.11	—	28.86	7.94
Residential mobility (per 1000 residents)	—	48.00–170.50	—	85.79	21.49

Appendix B

See Table B.

Table B Correlations between locality characteristics^a

	1	2	3	4	5
<i>Neighbourhood level (N = 503)</i>					
1. Ethnic heterogeneity	—	0.15	−0.14	0.42	0.64
2. Economic heterogeneity	—	—	0.54	0.18	0.15
3. Mean income	—	—	—	−0.03	−0.28
4. Crime	—	—	—	—	0.42
5. Residential mobility	—	—	—	—	—
<i>Municipality level (N = 245)</i>					
1. Ethnic heterogeneity	—	0.55	0.25	0.77	0.67
2. Economic heterogeneity	—	—	0.67	0.47	0.39
3. Mean income	—	—	—	0.19	−0.15
4. Crime	—	—	—	—	0.65
5. residential mobility	—	—	—	—	—

^aAll correlations significant at the $\alpha < 0.05$ level (two-tailed).

Appendix C

See Table C.

Table C Variance components of hierarchical random intercept regression models explaining social cohesion

	<i>Contact neighbours</i>		<i>Tolerance neighbours different race</i>		<i>Generalized trust</i>		<i>Voluntary work</i>	
	<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>
<i>Empty model</i>								
Municipality level	14.31	1.67**	0.05	0.00**	0.05	0.01**	0.15	0.03**
Neighbourhood-level	14.51	2.49**	0.03	0.00**	0.22	0.05**	0.09	0.03**
Individual level	1018.50	1.03**	0.64	0.04**	—	—	—	—
<i>Model controlled for composition effects^a</i>								
Municipality level	4.24	3.07	0.04	0.00**	0.05	0.02**	0.07	0.02**
Neighbourhood level	14.11	2.45**	0.02	0.00**	0.09	0.03**	0.07	0.03**
Individual level	977.61	1.03**	0.61	0.04**	—	—	—	—

**Table C** *continued*

	<i>Contact neighbours</i>		<i>Tolerance neighbours different race</i>		<i>Generalized trust</i>		<i>Voluntary work</i>	
	<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>	<i>b</i>	<i>se</i>
<i>Full model^b</i>								
Municipality level	2.49	8.24	0.03	0.00**	0.03	0.01*	0.01	0.01~
Neighbourhood level	16.16	2.26**	0.02	0.00**	0.07	0.03**	0.07	0.03**
Individual level	971.98	1.03**	0.61	0.04**	—	—	—	—

^aIndividual level characteristics included: age, sex, marital status, household composition, level of education, level of income, work status, health status, denomination, church attendance and ethnic origin.

^bModels include all individual level characteristics, for the included locality characteristics and cross-level interactions we refer to Table 2.

~ $\alpha < 0.10$; * $\alpha < 0.05$; ** $\alpha < 0.01$ (two-tailed).